

VIII. *Notes on the Habits of the Box-Tortoise of the United States of America,*  
*Cistuda Carolina, Gray.* By GEORGE ORD, Esq., F.L.S., &c.

Read November 2nd, 1841.

THIS animal is common in Pennsylvania, where it is known under the names of Land-Tortoise and Land-Turtle. It appears to be more attached to dry situations than to those which are wet; and when found in the latter, it may be conjectured that some favourite food had attracted it thither. In the swamps where the night-heron (*Ardea nycticorax*) breeds, we may be sure of finding the Land-Tortoise feeding upon the remains of the fish which lie scattered under the trees inhabited by the herons. This tortoise seems to prefer animal food when in a putrid state. Insects and worms, and the various kinds of tender mushrooms, are its common fare. On strawberries, raspberries, and soft peaches it feeds greedily.

The flesh of this harmless animal is excellent; but our farmers seldom eat it, through a prejudice similar to that which prevents them from eating frogs. Some few years ago, a retired naval officer took up his abode in the county of Bucks, Pennsylvania. This gentleman, being an epicure, commissioned the boys in the neighbourhood to procure him bull-frogs and land-tortoises. This strange attachment to heathenish food was the occasion of our officer's conduct being viewed with suspicion: indeed some gossips ventured to affirm that the poor man had lost his reason.

The Box-Tortoise hibernates in the earth. About the middle of October it retires to its winter-quarters, which are well selected in regard to convenience and warmth, a loose soil and a southern exposure being desirable. A heap of decayed brush-wood is not unfrequently chosen as a cover to its retreat. In severe winters some of these animals perish, in consequence of not having penetrated the earth to a depth beyond the reach of frost. About the 20th of April the tortoises reappear. On emerging from their hibernacle they are

feeble, and do not use much exercise until invigorated by a warm atmosphere.

I kept a number of these animals for several years in my garden, where they had ample range, abundance of suitable food, and convenient places of winter retreat. Notwithstanding these advantages, they but seldom produced young, although they regularly deposited their eggs in the earth at the proper season. This I am induced to attribute to the circumstance of the eggs having been destroyed by the pismires, as happened in an instance hercafter to be related.

From my books of memoranda I make the following extracts:—

“ 1814. *June 22, Wednesday.* This evening, about sunset, I beheld one of my land-tortoises in the act of digging a place of deposit for her eggs. She scooped out the earth with her hind-feet, using them alternately. The hole was dug as deep as she could reach, and the earth at the bottom was loosened, after a sufficiency had been removed to the surface. The first egg was secured in the loose earth at the bottom of the hole; in four or five minutes another egg was laid, and disposed of in the same manner; and so on, until six eggs were laid, about the same time elapsing between each. The earth was now scraped from the sides of the hole (which was also done after each egg had been laid), and carefully pressed upon the eggs; and finally she reached that upon the surface, scraping it into the hole by degrees, and packing or treading it at intervals. All this ceremony occupied a considerable time; and she had not finished filling up the hole when I left the place, which was about nine o'clock. She kept in one position during the whole process, except what change her motions made in digging and covering. The eggs appeared to come from her with all the facility and speed of fæces. Shortly after laying the last egg she uttered a guttural sound, several times repeated. She wrought altogether with her hind-feet, alternating frequently; and did not once look at the deposit during the operation.

“ *June 23.* This morning I examined the deposit, and found the hole so carefully covered up, that its exact situation was not visible without search. There was the appearance of urine having been ejected upon the spot. I removed the eggs into a box partly filled with earth, which box I have placed upon the roof of an out-house. My tortoises lay every season, but the eggs

do not hatch : this must be owing to the ants eating them. Though I have kept tortoises for several years, I have never known more than two or three instances of their breeding. There is in my garden at present one tortoise, which was hatched there three or four years ago : it is now not more than half-grown.

“ Where the eggs laid in the deposit the cavity was roundish ; the upper part of the hole was oblong.

“ On the evening of the 24<sup>th</sup> of *June* 1813, I saw one of my tortoises preparing a deposit for her eggs ; and her mode of proceeding was similar to that of the one above-mentioned. However, I did not see her lay owing to the approach of darkness. The next morning I examined her nest, and perceived in it three eggs. I marked the spot, and re-examined it in the autumn, but found only the shells of the eggs ; and these shells had no foetal indications about them.

“ The eggs in the box, mentioned above, shared the fate of the others ; they were destroyed by the pismires.

“ *Tuesday, June 26, 1832.* Being a few days ago in the country, I procured ten individuals of our land-tortoise, the greater part females. These were set at large in our garden. This evening, after sunset, I observed three of them in the act of digging holes wherein to deposit their eggs. The approach of night prevented my seeing them lay. Two of them having been disturbed, they abandoned the place.

“ *June 27.* One of the before-mentioned tortoises succeeded in depositing her eggs, and carefully covered them up as usual. I have placed stakes around the spot. The hole was dug entirely with the hind-feet, as in the instance before related.

“ *June 29.* Yesterday evening, just before sunset, one of the tortoises which had been disturbed when about to lay, dug out a fresh hole and deposited her eggs. It would hence seem that these animals possess the power of retaining their eggs, when circumstances occur to render it necessary.

“ *July 2.* This evening, at the usual hour, two of my tortoises laid.

“ *July 3.* Another tortoise deposited her eggs near the spot selected by one of those of yesterday. Some of these tortoises, if not all of them, have laid twice this season.

“ *Monday, September 24.* This day one of the eggs of the deposit of the 28th of June was hatched; it was the uppermost egg. I took notice of the young just as it struggled out of the shell: it seemed to be almost blind; its case was very soft or cartilaginous; and in the centre of the under shell, or between the abdominal and the femoral shields, there was a large umbilical process. This animal was tolerably active, although the earth was cold from the effects of a north wind: it could crawl with ease. It measured an inch in length on the upper shell. I looked at four other deposits, and found the eggs in an apparently good state. I have removed eight of these eggs, and secured them in a box of loose earth, in the hope that the embryos will be matured. From the foregoing dates, it appears that the egg laid eighty-eight days in the ground before it was hatched.

“ *Saturday, September 29.* I examined yesterday the deposit of the eggs of the tortoise which laid on the 26th of June. I could not perceive that any of them were hatched. The ants having commenced eating the shell of the uppermost egg, I removed it and opened it: it contained a perfectly-formed foetus, attached to a yolk-bag, which, from the size of the latter, together with the quantity of albumen, wherein the whole floated, led me to believe that the animal would not have come forth for some days yet: it is alive: it measures an inch in length on the upper shell: the yolk-bag is three quarters of an inch long.

“ *September 30.* The young tortoise, mentioned yesterday, which I had placed carefully in a bed of cotton, died last night.

“ Examined another deposit, and found all the eggs addled.

“ *October 14.* This morning another young tortoise appeared, from the deposit of the 28th of June. It is livelier and larger than that first hatched, measuring an inch and three quarters in length on the upper shell: its eyes are completely open. It is probable that this tortoise has been brought forth some days, although it did not succeed in working its way to the surface of the earth until this morning. When I first observed the one which appeared on the 24th of September, it had the shell adhering to it.

“ *Monday, October 15.* This morning another young tortoise made its appearance: it is of a size between the other two. All three seem to be in good health.

“ I inspected the deposit from which the three tortoises proceeded, and

found a fourth one yet in its shell, but struggling to get free. The nest contained five eggs. One egg was addled.

“ The last young one, still in its shell, I replaced into the earth, near the surface; and in the afternoon it succeeded in disengaging itself, and came forth. It is rather larger than any of the rest. The one first hatched is the smallest of all. The difference between the age of the first and that of the last is worthy of note; it being no less than twenty-one days. The first remained in the shell eighty-eight days; the last, one hundred and nine days. But this difference may have been owing to the first egg's having been near the surface of the earth, and, consequently, having possessed the advantage of the sun; and yet the egg which I opened on the 28th of September, and which contained a living young one, was also near the surface, in a warm spot. If I had not opened this egg, I doubt whether its embryo would have been matured much before this date.

“ The old tortoises are now preparing to latibulize. They conceal themselves in their retreats during the cool weather, and come out on a warm day.

“ *October 21.* Examined the eggs which I placed in a box of earth on the 24th of September. Found them heavy and plump; opened one of them: it contained a living young, not quite so large as that mentioned on the 29th of September. The yolk-bag was considerably larger than that of the other; and so great was the quantity of albumen, that the moment I made an orifice with my penknife, it spouted out with force. The albumen did not entirely fill the cavity of the egg opened on the 28th of September; there was a large dint in it when I took it from the earth.

“ *December 1.* The old tortoises have all retired into their winter quarters.

“ Finding that no more young ones came forth, I took up all the eggs that I had any knowledge of. Every egg contained a foetus, each having a pretty large yolk-bag, showing that they were not yet sufficiently matured for exclusion. One contained an embryo hardly a fourth part as large as the rest, though its form was nearly complete. Two only of the eggs contained living young; the rest appeared to have been dead for some days, as the yolk-bags were disengaged from the animals, and showed signs of decomposition, although they had not become putrid. We have had some severe frosts this season: the

surface of the ground has been hardened by them, and these have, doubtless, occasioned the death of the embryos.

“ It should seem that the late summer did not prove sufficiently warm to favour the production of these singular animals ; for with all the advantages which our garden affords, (and it lies well exposed to the sun,) out of upwards of twenty eggs, but four brought forth mature young. One of these four escaped from the inclosure some days ago : the remaining three I have placed near some old tortoises ; and have spread hay over the *latibulum*, to guard them from the rigours of winter.”

In the month of March, 1833, I removed to the country ; consequently I lost the opportunity of making any further observations on the tortoises which remained at the city residence. I learned, however, that the young ones re-appeared in the spring with the adults, and lived in the garden for several years.

Philadelphia, September 26, 1840.